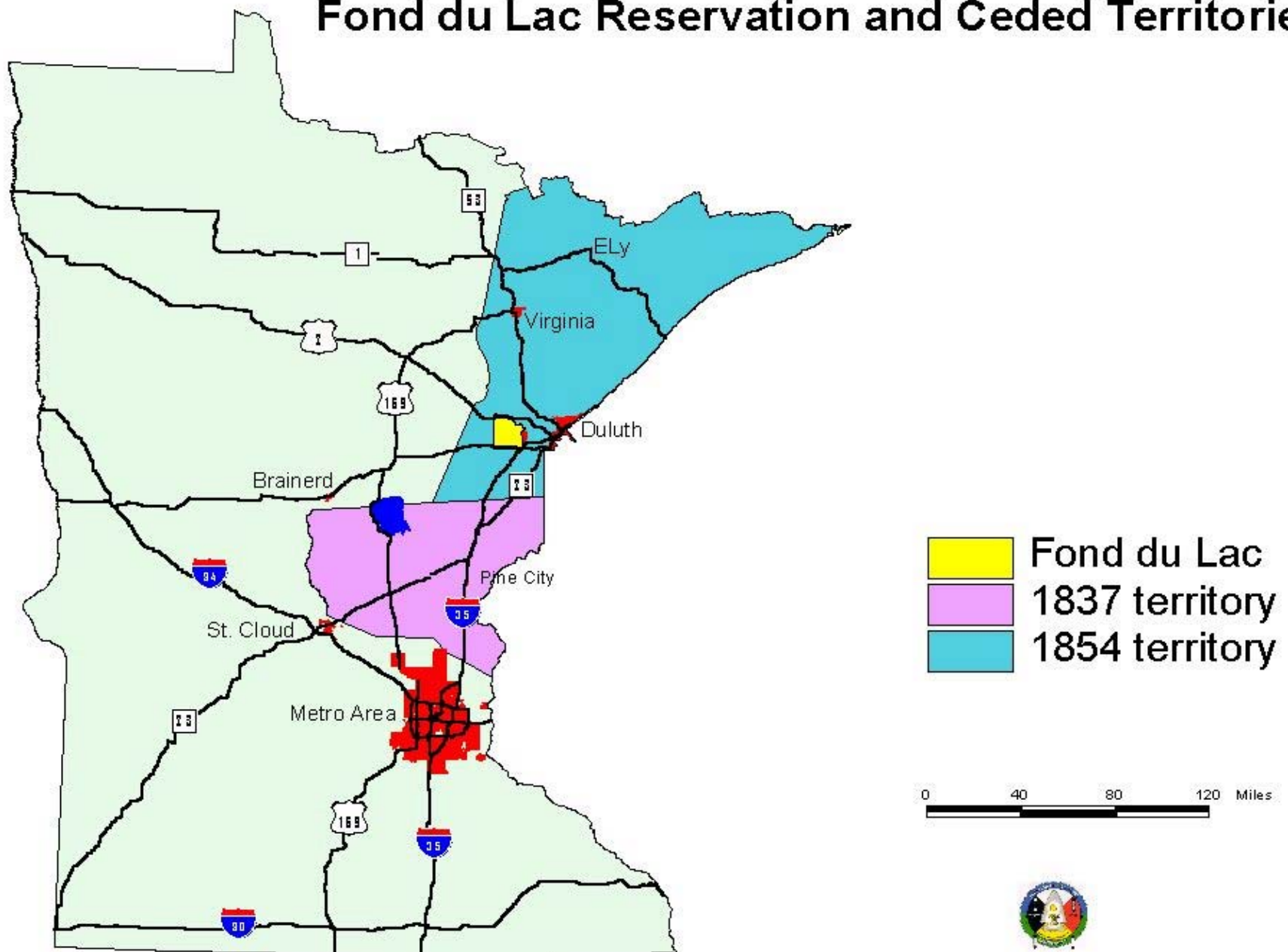


# Fond du Lac Water Quality Monitoring: Our Strategy for Protecting Reservation Waters

Presentation to Surface Water Monitoring and Standards meeting  
Chicago, IL  
Feb. 4, 2004




# Fond du Lac Reservation and Ceded Territories






# Treatment as Affected State

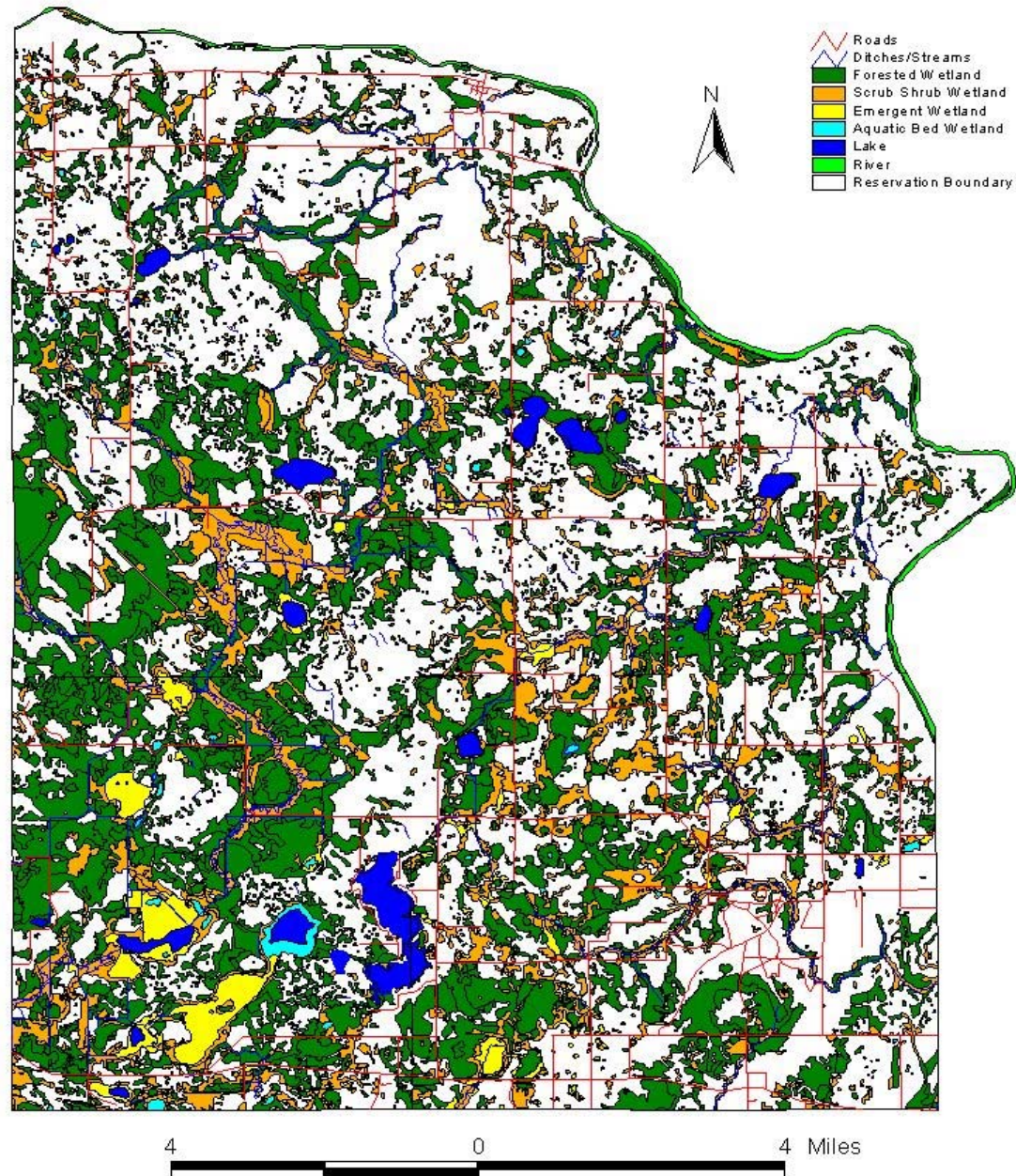
- Tribe is recognized by Secretary of Interior
  - Governing body carrying out duties
  - Water resources lie within reservation borders
  - Capability to administer effective water quality standards program
- 



# Water Quality Standards

- RBC adopted in 1998; EPA approved in 2001
  - Tribal-specific designated uses, including cultural and aesthetic
  - Protect human health in the context of a subsistence lifestyle
  - “Outstanding Reservation Resource Waters”
  - Exercise sovereignty
- 


## Map 5 - Fond du Lac Wetland Types







# WQ Monitoring Plan

- Tiered strategy developed (use classes, priority resources)
  - Physical, chemical and biological parameters measured
  - Capture seasonal, annual variability
  - Determine if waters are meeting their designated uses or impaired
  - EPA-approved Quality Assurance Project Plan, updated annually
- 



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# Biological Monitoring

- With no permitted discharges on the reservation, decided to focus on biological integrity
  - Stream habitat assessments following RBP for low-gradient streams
  - Two or three trophic levels sampled in lakes and streams
- 





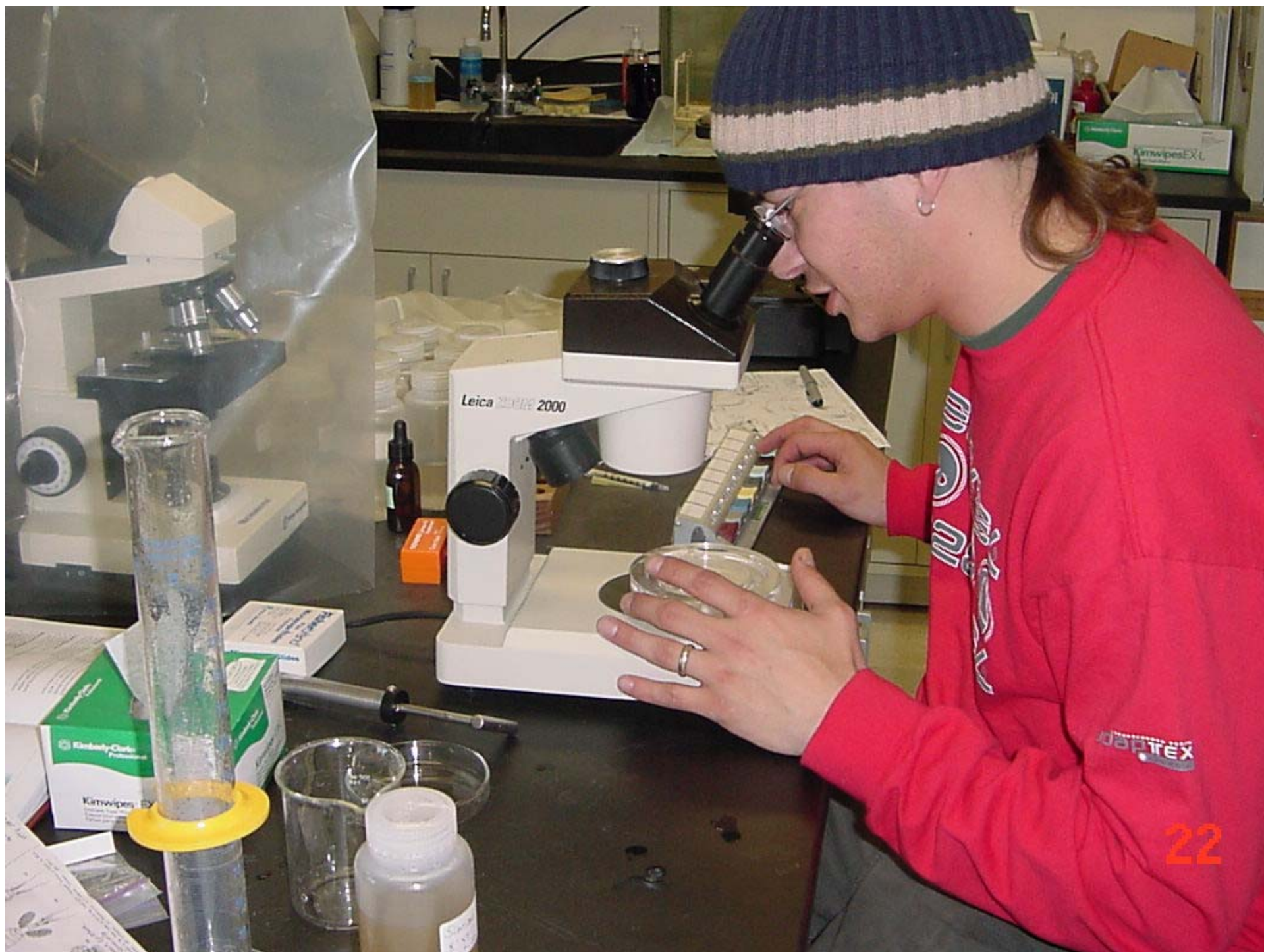






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# Milestones in Monitoring and Assessment

- Developed comprehensive database
  - Submitted first tribal 305(b) report
  - Framework for assuming permitting authority on reservation (401, 404)
  - Triennial review of WQS; biological and nutrient criteria
  - Define reference condition for different waterbody classes
- 






# Beyond Baseline

- Hydrologic disruptions
  - Identify restoration projects (EQIP, Circle of Flight, others)
  - Wastewater feasibility study
  - Nonpoint Source Assessment Report and Management Plan
  - NSF grant to study nutrient cycling in wild rice ecosystem
- 




# Tribal Development

- Responsive to economic development needs
  - Wetlands Specialist more involved in stormwater planning, erosion control, housing site reviews under NEPA
  - Ground water, expanded surface water monitoring and protection at golf course
- 




# Contaminants Monitoring

- Tribal community relies upon natural resources for subsistence: wild rice, fish, waterfowl, game
  - Health concerns from exposure to environmental contaminants
  - Resource monitoring and protection efforts have targeted mercury
- 






# Ecosystem Sensitivity

- Boreal forest/wetland ecoregion is especially sensitive to mercury deposited in watersheds
  - Ionic and elemental forms more likely to be methylated
  - Greater bioavailability to aquatic food web
  - Bioaccumulation in higher trophic levels: piscivorous fish, eagles, osprey, loons, kingfishers, mink, otters....and people
- 




# Tribal Air Monitoring

- Participation in National Atmospheric Deposition Program since January 1997 (acid deposition, chemistries)
  - Total mercury in precip since 1998
  - Methyl mercury in precip since 2000
  - EPA approved TAR in 2004
- 



# Sediment Assessments


- GLNPO funded study of 12 reservation lakes: characterize sediments, assess contaminant levels in bioavailable portion (Hg, PCBs, Pb), toxicity tests
  - Sediment quality database developed; an additional indicator of reservation water quality; included in 305(b) report
  - Weight of evidence approach to decision-making about water resources
- 








# Phase II Sediment Study

- Second GLNPO project included twelve St. Louis River sites; same parameters plus methyl mercury
  - Analyzed archived samples from first study for meHg
  - Fond du Lac sediment data may be included as reference in St. Louis River AOC database
- 




# Integrated Mercury Data

- Determined atmospheric loading rates of Hg, meHg
  - Analyzed relationships of sediment Hg, meHg and sediment characteristics
  - Looked at watershed-scale relationships
  - Correlations seen with water quality parameters (color, TSS)
- 




# Transfer to Biota

- Partnered with MN Dept. of Health to study fish contaminants; develop culturally sensitive consumption guide
  - Fish collected from reservation waters; targeted species that are commonly eaten
  - Mercury drives Fond du Lac consumption restrictions (ruled out PCBs, organochlorine pesticides, toxaphene)
- 






# Wild Foods Study

- Comprehensive risks/benefits analysis funded by MN Sea Grant
  - Cultural and nutritional benefits of wild foods (vs. market alternatives) offset contaminant exposure
  - Wild rice, waterfowl, moose analyzed for Hg, Pb
  - Waterfowl and fish have comparable Hg
- 



# Next?

- Expanded biological monitoring: macrophytes, lake benthos, lake fish surveys
  - St. Louis River monitoring – partner with MN Department of Natural Resources
  - Sample more waterfowl, fish
  - Continue to refine monitoring program, including effectiveness of NPS BMPs
- 

USEPA Region 5  
Great Lakes National Program Office  
MN Dept. of Health  
Univ. of Minnesota Sea Grant  
Fond du Lac Reservation Business Committee

